

May 28th 2008, J. Wresnik

Comparison of different network sizes, with respect to EOP, scale and baseline length for the same Cn values and wind conditions at all station

Specifications:

schedules: st16uni_45_9_230X_0_0
st24uni_45_9_230X_0_0
st32uni_45_9_230X_0_0

software: OCCAM Kalman

clk: ASD 1e-14 @ 50 min, random walk + integrated random walk

zwd: Vienna turbulence with same Cn and same wind values for all stations, only the random numbers are changed for the simulation

wn: 4 ps per baseline

zwd: 0.7

grd: 0.5

By looking at the EOP series, we can see that going from a 16 station network to a 24 station network the rms for dut, xpol and ypol are clearly improved, while from 24 to 32 the improvement for ypol is clear only.

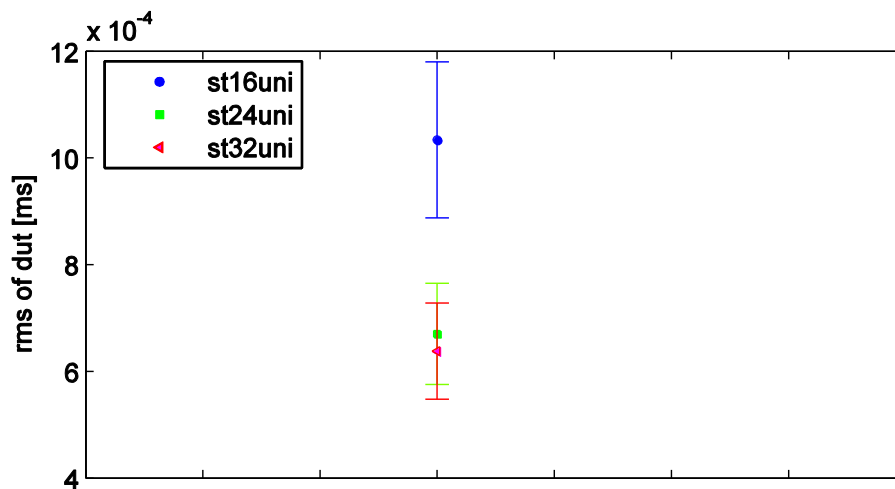


Figure 1: rms of dut1 for 16, 24 and 32 station network using the same turbulence parameters in the simulation.

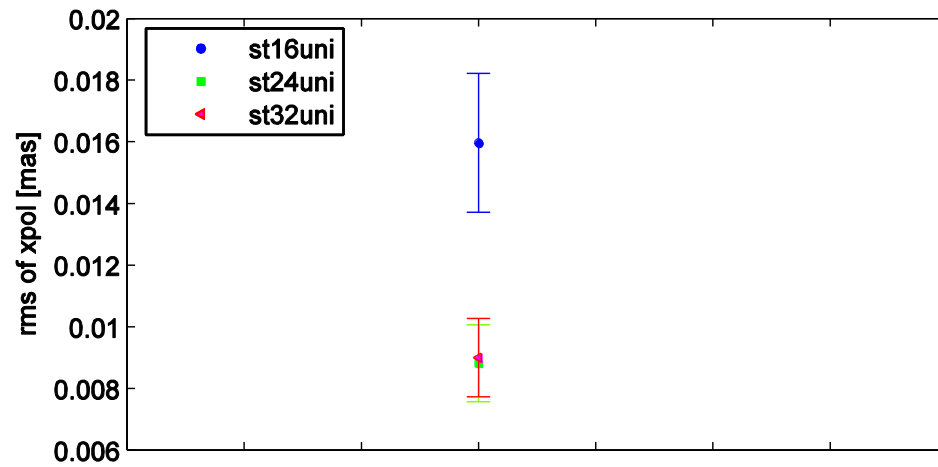


Figure 2: rms of xpol for 16, 24 and 32 station network using the same turbulence parameters in the simulation.

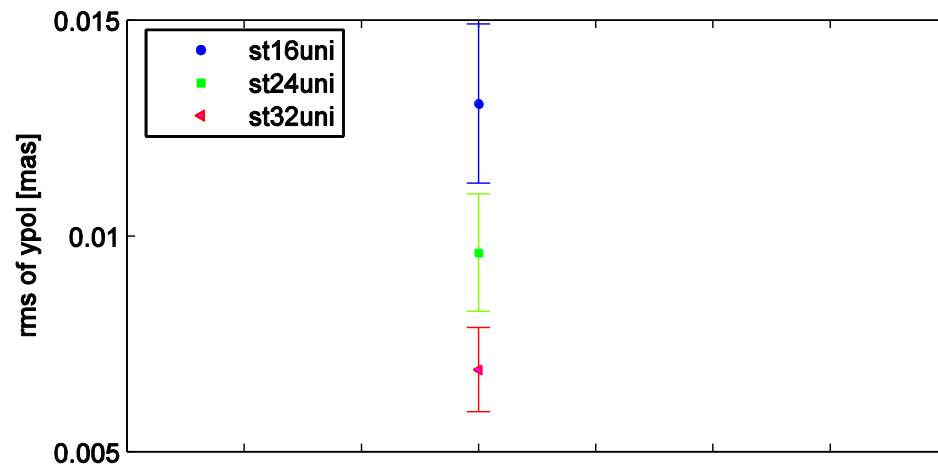


Figure 3: rms of ypol for 16, 24 and 32 station network using the same turbulence parameters in the simulation.

By looking at the change of the rms values for the scale after a 7 parameter Helmert transformation, a steady improvement can be seen for using larger networks.

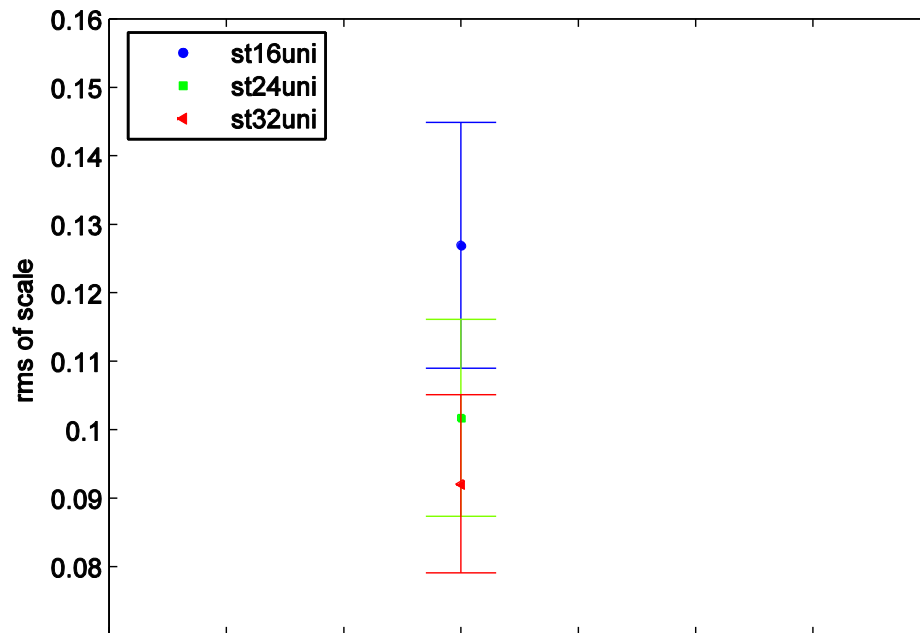


Figure 4: rms of the scale for 16, 24 and 32 station network using the same turbulence parameters in the simulation.

By looking at the baseline length repeatabilities we can see an improvement for the larger networks, but in general the scatter is much higher than the scatter of the simulations done with station dependent Cn and Wind values. For comparison, Figure 6 shows the baseline length repeatabilities for the simulation with individual Cn and wind values for each station, which might be more realistic.

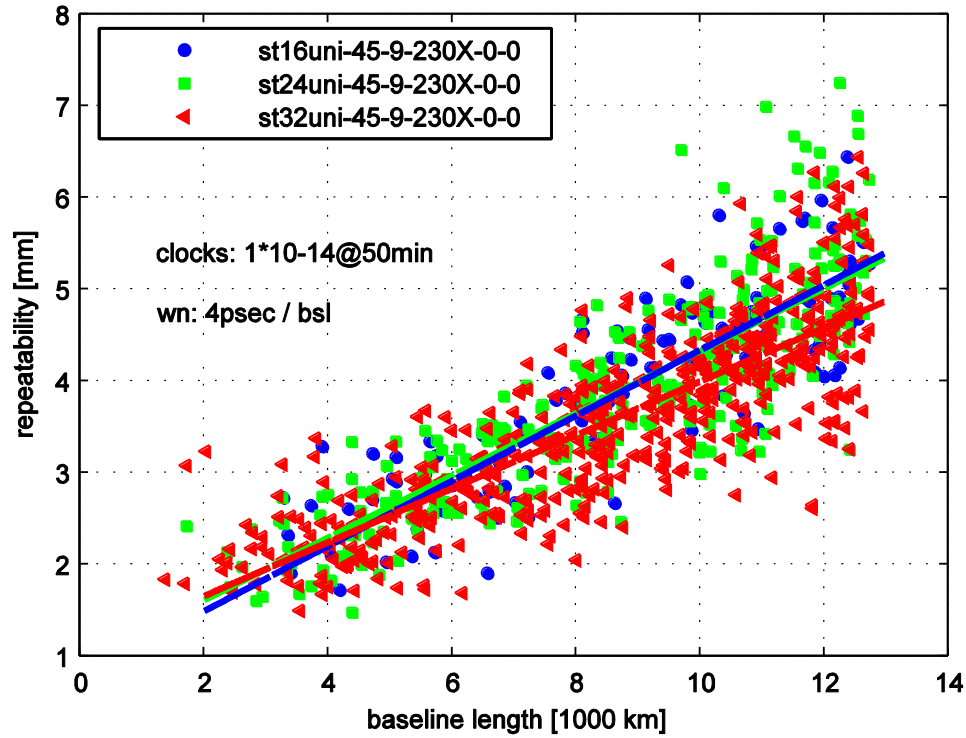


Figure 5: Baseline length repeatabilities for different schedules using the same turbulence parameters in the simulation.

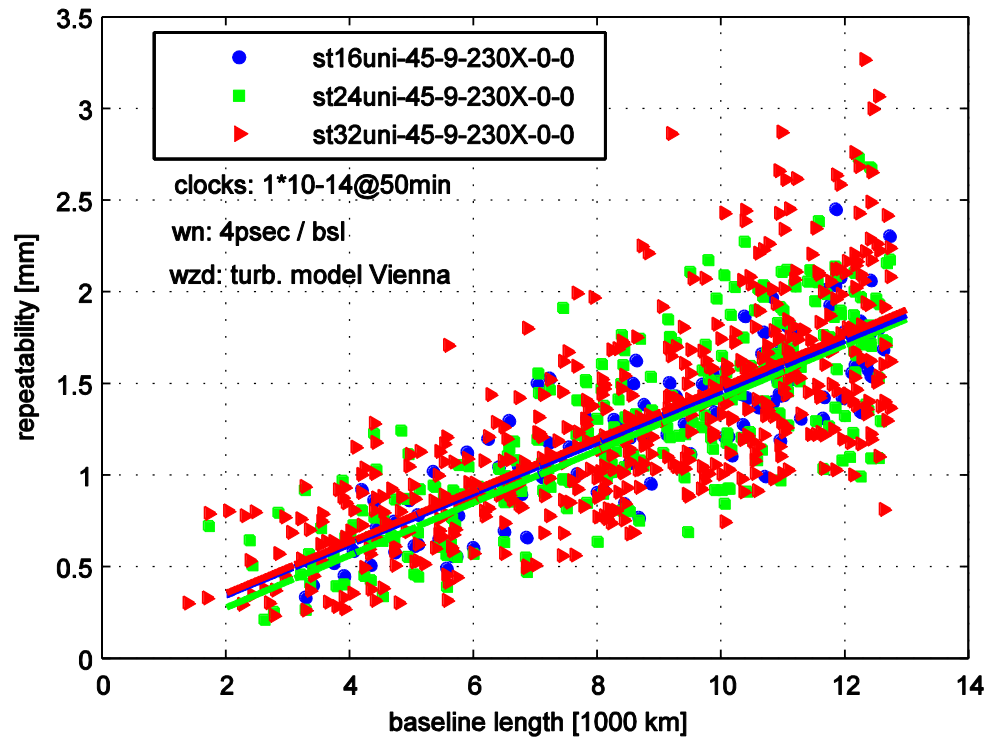


Figure 6: Baseline length repeatabilities for different schedules using the same turbulence parameters in the simulation.